IS 11528 (1985): Dimensions for reels for 16 mm motion picture projectors (up to and including 120 m capacity: 18 mm size) [MED 32: Photographic Equipment]

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Indian Standard

DIMENSIONS FOR REELS FOR 16 mm MOTION-PICTURE PROJECTORS (UP TO AND INCLUDING 120 m CAPACITY, 18 mm SIZE)

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Indian Standard

DIMENSIONS FOR REELS FOR 16 mm MOTION-PICTURE PROJECTORS (UP TO AND INCLUDING 120 m CAPACITY, 18 mm SIZE)

Cinematographic Equipment Sectional Committee, ETDC 47

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Indian Standard

DIMENSIONS FOR REELS FOR 16 mm MOTION-PICTURE PROJECTORS (UP TO AND INCLUDING 120 m CAPACITY, 18 mm SIZE)

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 9 December 1985, after the draft finalized by the Cinematographic Equipment Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard covers the dimensions and characteristics of 16 mm motion-picture film projection reels with nominal flange diameters of 7, 10, 13 and 18 cm.

0.3 Supplementary information for the benefit of the manufacturers and users is given in Appendix A.

0.4 In preparing this standard assistance has been derived from ISO : 1793-1975 'Cinematography-Reels for 16 mm motion-picture projectors (up to and including 120 m capacity, 18 cm size)-Dimensions', issued by International Organization for Standardization.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard specifies the dimensions and characteristics of 16 mm motion-picture film projection reels with nominal flange diameters of 7, 10, 13 and 18 cm.

*Rules for rounding off numerical values (*revised*).

2. DIMENSIONS

2.1 The dimensions shall be as shown Fig. 1 and 2 and given in Tables 1 and 2.

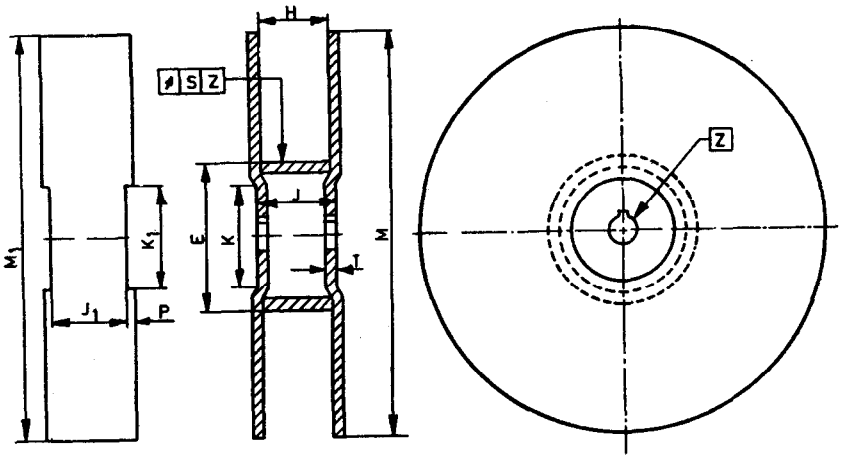

FIG. 1 PROJECTION REEL AND MAXIMUM VOLUME OF ROTATION

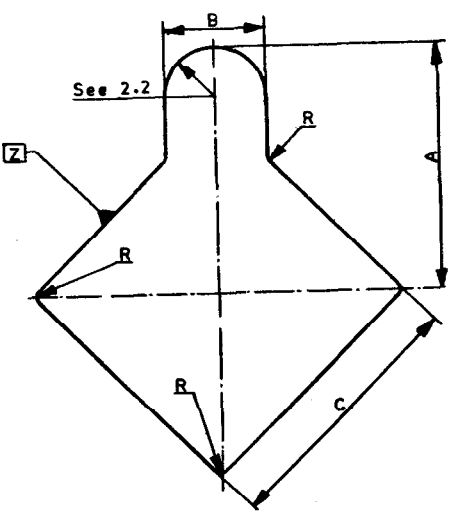

FIG. 2 ENLARGED VIEW OF SPINDLE HOLE AREA

TABLE 1 STANDARD REEL SIZES

(*Clause* 2.1)

Reel Size Designation cm	Dimension	mm	Nominal Reel Capacity m
(1)	(2)	(3)	(4)
7	M and M_1	$75{\cdot}0\ ^{+\ 0}_{-\ 1{\cdot}0}$	15
	E	$32{\cdot}5 \pm 0{\cdot}5$	
	P	0·9 *Max*	
10	M and M_1	$100{\cdot}0\ ^{+\ 0}_{-\ 1{\cdot}0}$	30
	E	$45{\cdot}5 \pm 0{\cdot}5$	
	P	1·1 *Max*	
13	M and M_1	$128{\cdot}0\ ^{+\ 0}_{-\ 1{\cdot}0}$	60
	E	$45{\cdot}5 \pm 0{\cdot}5$	
	P	1·5 *Max*	
18	M and M_1	$180{\cdot}0\ ^{+\ 0}_{-\ 3{\cdot}0}$	120
	E	$60{\cdot}5 \pm 0{\cdot}5$	
	P	2·0 *Max*	

TABLE 2 DIMENSIONS OF REELS

(*Clause* 2.1)

Dimension	mm
(1)	(2)
A	$7{\cdot}6^{+0{\cdot}5}_{-0}$
B	$3{\cdot}1^{+0{\cdot}4}_{-0}$
C	$8{\cdot}05^{+0{\cdot}10}_{-0}$
H	$17{\cdot}0^{+1{\cdot}5}_{-0}$
J and J_1	$20{\cdot}0 \pm 0{\cdot}5$
K and K_1	25·5 *Min*
R	0·2 *Max*
S	0·0 *Max*
T (*see* **A-2** and **A-3**)	

2.2 The tip of keyway, if rounded as shown in Fig. 2, may have a minimum radius of $B/2$. If, instead, the tip of the keyway is made square as illustrated by the chain line, the square tip shall observe the limits of A.

2.3 Dimension J_1 applies within the zone of diameter K which is centred on the spindle hole axis. It is not intended to imply, however, that this zone must be a depressed area. Depending upon the values selected for J_1 and P, the entire flange might be flat or the zone of diameter K might even be slightly raised.

2.4 The outside surfaces of the flanges which lie outside the zone of diameter K shall fall between the planes defined by $J_1 + 2P$.

2.5 Dimension P is the distance measured outwardly from the reference plane to the plane of rotation generated by the thickest and/or most eccentric point on the flange outside the zone of diameter K when the reel is rotated on an accurate, tight-fitting spindle. This includes rivets or other fastening devices, variations in flange thickness, flatness and lateral run-out of the flanges.

The reference plane of rotation for each flange is defined as a plane perpendicular to the axis of the spindle and coincident with the surface of a flat 15·0 mm diameter support which is in contact with the flange and centred on the spindle hole axis of the flange.

NOTE — The reference plane from which P is measured is not necessarily coincident with all points within the zone of diameter K, but only needs to be coincident with those which are in contact with the reference support which has a diameter smaller than K.

3. CHARACTERISTICS

3.1 Each flange, preferably, shall have a square spindle hole with corner keyway with dimensions as shown in Fig. 2, alternatively, one flange may have a round spindle hole with a diameter of C (and no keyway).

3.2 If square spindle holes with corner keyways are used in each flange, the holes shall be aligned so that a square test bar 8 mm × 8 mm may be passed completely through the reel. (It is also preferable that the keyways be aligned.) If a square spindle hole in one flange and around spindle hole in the other flange are used, the holes shall be aligned so that a cylindrical test bar of 8 mm diameter may be passed completely through the reel.

3.3 Provision shall be made for securing the end of the film so as to accept the full width of the film, and in such a way that the film will be freely released at the end of its run.

3.4 For reels with flanges up to and including 10 cm the flanges shall be provided with holes permitting the ready observation of the film attachment device. For reels with flanges 13 cm and greater, the flanges should also be provided with access holes below the film attachment device and of adequate size to furnish comfortable access for securing the film.

APPENDIX A

(*Clause* 0.3)

SUPPLEMENTARY INFORMATION

A-1. SPINDLE-REEL FIT

A-1.1 Loose fit between a projector spindle and a reel spindle hole can contribute flange excursion not measured in the axial run-out measurement given in **2.4**. This can be minimized by incorporating a support surface of not less than 16 mm and preferably of 25 mm diameter at the base of the spindle and by locking the K diameter area of the reel flange flush against this support.

A-2. REEL-LOCKING DEVICE

A-2.1 A few existing spindle designs have detent reel-locking means which act against the inside wall near the spindle hole of the flange which is placed closest to the base of the spindle. Thus, dimension T has been specified to ensure satisfactory performance on the spindles.

A-2.2 The value of dimension T shall be $1{\cdot}5\ ^{+0}_{-0{\cdot}8}$ mm.

A-2.3 To provide correct fastening of the reels, dimension T is considered to be necessary within the zone of diameter K, but for future spindle designs and construction, it is recommended that all locking means act against the full width J_1. Thus, eventually, the need for specifying T might be obviated.

A-3. PLASTIC RETURN REELS

A-3.1 Dimension T would require an unobstructed space within the hubs near those portions of the inside surfaces of both flanges which are near the spindle hubs. It is recognized, however, that most moulded 'return' reels (those supplied by processors for return of film to customer) and most very large capacity reels (not listed in this standard) have spindle holes in the form of a solid-walled shaftway passing completely from one flange to the other.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	Unit	Symbol	Definition
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2